KEEP THE ISLAND CLEAN!
Put litter in its place.

Roadside Litter Survey Report 2002

Southeast Environmental Association

Prince Edward Island
CANADA

102-06755/

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Introduction

Litter is no more of an issue for Prince Edward Island than it is for any other jurisdiction in North America. Litter can be found in many public places that include roadsides, trails, parks and beaches. P.E.I. is a small, but densely populated province with an extensive road network. P.E.I. also has more roads per capita than any province in Canada.

This study was commissioned by the Provincial Department of Fisheries, Aquaculture and Environment and is designed to look specifically at the issue of roadside litter in P.E.I. The Department is working with a multi-stakeholder committee to address the litter issue through regulation and/or education and awareness.

The P.E.I. Litter Awareness Committee is comprised of the following organizations:

- Island Waste Management Corporation
- PEI Liquor Control Commission
- Seaman's Beverages Ltd.
- Tourism PEI
- Tourism Industry Association of Prince Edward Island
- Southeast Environmental Association (SEA)
- City of Charlottetown
- PEI Department of Fisheries, Aquaculture and Environment
- Prince Edward Island Fluid Milk Processors Association
- Construction Association of PEI
- Federated Women's Institute of Prince Edward Island
- Federation of Prince Edward Island Municipalities
- PEI Department of Transportation and Public Works
- Canadian Restaurant and Foodservice Association
- Canadian Council of Grocery Distributors
- National Association of Tobacco & Confectionary Distributors

In order to address the issue of litter, the Department must first ascertain the extent and nature of the issue. This survey is but one step to understanding litter as an issue in P.E.I.

SEA would like to acknowledge the financial support of the Shell Environmental Fund and the PEI Department of Fisheries, Aquaculture and Environment to complete this survey.

Survey Methodology

Overview

The methodology used for this survey was a cross section of other surveys completed. The methodology utilized the standard definitions and procedures that have become more common place. The previous Island survey did not take into account these methods and has been used for information purposes only.

A survey of litter along P.E.I. roadsides was conducted in July 1990. It used roads totalling a length of 515 kilometres as a representative sample for the province. Along these highways, a total of 138 sites of 500 metres each were sampled. It is unclear from the methodology how these sites were determined and why a total of 138 sites were sampled. Since major highways were used in the previous work, they also form a part of this survey.

Litter Definition

This survey focussed on visible litter which is defined as:

> "Litter is an article of human made or human transported solid waste that has been deposited or disposed of in an improper place. Excludes natural flora and fauna, dog and cat litter, agricultural products and tree bark. Articles below bottle cap size (1 inch diameter) such as cigarette butts are excluded. All fragments of a broken glass container, mirror or similar brittle object are counted as one item." (Ontario Litter, 1990, p. 29)

Three sites representing a different county and a different setting (rural/urban), were randomly selected to include cigarette butts in the data recorded. No other litter smaller than 1 inch diameter was included at these sites.

Site Length and Width

Each survey site was 100 metres in length with both sides of the road accounting for 200 metres of linear area surveyed. The width of sites surveyed was determined by the characteristics present at the survey site. The measurement of the width was calculated from the edge of the pavement and extended to the presence of a litter catch point. These features include fences, tall grass or a hedgerow. The maximum site width for a site was 10 metres.

Site Selection

Sites were selected at random but were also representative of primary, secondary and clay roads across urban and rural areas. Special consideration was given to select sites in areas served by the Waste Watch program (refer to p. 11) to determine if the program makes a difference in the issue of roadside litter.

A total number of 45 sites was determined as desirable with an equitable number of sites in urban and rural areas, and in each of the counties. It was hoped that through the random selection process, at least eight would be from an area serviced by the complete Waste Watch program.

Site Alteration Criteria

Once selected, a site was not rejected due to lack or excess of litter. If a site contained less desirable criteria, it was moved 500 metres to the northwest to avoid the obstruction. The less desirable criteria included:

- Bridge - as part of survey site or the majority of the roadside is submerged.
- Construction - a site where the presence of construction and/or demolition debris is obvious due to construction activity.
- Security and Safety - addresses concern for the safety of the survey crew. This includes dangerous bank conditions, blind road corners, or a site containing material deemed to be hazardous.
- Waste Management Facility - survey site is adjacent to a legally authorized waste disposal or recycling facility.
- Women's Institute Roadside Cleanup - survey site has obviously been cleaned up as part of the program. Bags are lined up along the roadside.

Enforcement Action

A protocol was in place whereby sites containing hazardous materials or what could be deemed to be illegal dumping would be reported immediately to the PEI Department of Fisheries, Aquaculture and Environment via its toll free number (1-800-565-1633).

Sampling Time Frame

Spring time was selected as the sampling time frame to allow for the maximum amount of waste to be found. The sampling was completed after the snow left the roadside. The sampling took a couple of weeks and was completed in advance of the annual Women's Institute Roadside Cleanup to ensure, to the best of our abilities, the results were not impacted.

Quality Control

Surveyors were trained to conduct the survey through "hands on" training. This took place at three survey sites under full supervision. Results were reviewed and compiled on a daily basis. At least five digital photographs were taken at each site to record the quantity and type of litter representative of the site. Digital photographs were also used to help qualify unknown types of litter for data recording purposes.

Surveys were conducted in teams of at least two with one collecting waste and the other marking the survey sheets. Data recorders remained constant from the beginning of the survey to the end to ensure consistency in recording.

All litter collected at each site was bagged for appropriate disposal at a local waste management facility near the area where it was collected.

Reporting Methodology

The final report contains the following elements:

- Methodology - An overview of the methods used to collect the data and determine the survey sites is presented.
- Results - Presentation of the results amalgamated for all 45 sites. Results are presented in graphs as general categories of product types collected. Analysis of the data is broken out by region and by the demographics of the sites (rural and urban, full Waste Watch service area and non WW area, etc.).
- Discussion - Limited interpretation of the results are offered including any confounding issues that may have served to alter the results from the normally anticipated circumstances.
- Appendices - A list of survey locations, a sample of the data survey sheets and a summary of the average units collected per site are attached.

Discussion / Results

The survey did not take long to complete since it was not required to identify brands as part of the survey. Each site took an average of 30 minutes to complete once the site was identified and marked for survey. Late snowfalls and a residual of snow in some ditches did make it difficult to get the survey underway.

The time frame of spring was designed to allow for the least alteration in content of roadside litter. All of the waste discarded from the fall and winter would still be present while able to be found amongst the grass and shrubs in the ditch. The timing of the survey was critical with late snow falls covering the work area and getting at the material in advance of the annual Women's Institute roadside cleanup. It was also noted that bottle collectors had already begun to take material out of the ditches. It is this service that some local residents provide that may alter the sites and, therefore, the data from its original, intended condition.

Three of the 45 sites were examined for cigarette butts. The results were 383, 681, and 320 butts collected at each site. This item was smaller than the products outlined for collection in the survey criteria, but it was felt that it was important to have a handle on this component of litter. While the volume is not significant, the numbers far exceed other products collected for each survey area. While a time consuming item to find, collect and count, it is recommended that this item become a component of future litter surveys.

Results

Within the survey there were 22 specific categories and 10 general categories to classify waste items collected. The products found most often during the survey were food containers associated with take out service. This fact makes most sense given that these are the waste products most commonly associated automotive traffic. Most of the waste appears to be in rural areas but in close proximity to settled areas. The common theory that the driver gets a certain distance from the point of purchase, finishes the product and discards the refuse seems to hold true.

The Waste Watch program while almost fully implemented in the province did not have a significant difference on the quantity and type of litter found at roadside. There is a slight difference but not enough to suggest that the program has had an impact on roadside litter.

Compared to other areas in North America, the roadside litter here in PEI is comparable in terms of its composition. The volume appears to be less. This is most likely attributed to the annual roadside cleanup implemented each spring by the Women's Institute.

Note: Results are for product numbers and not total volume. All percentages presented have been rounded off to the nearest whole number.

Waste Sorting Categories

All waste was sorted into one of 32 different categories. The categories can be further sorted into five general product types. A list of the categories and *some examples* of each are listed below.

General Type	Category	Examples
Food Container	Cups	includes paper, plastic and styrofoam cups
	Lids	lids for cups
	Straws	
	Paper Food Pkg	typically a sandwich wrap
	Plastic Food Pkg	same as above
	Foil Food Pkg	typically burger wrappings
	Styrofoam Food Pkg	take out food platters, wrappings
	Sauce Pkg	small plastic and foil packs for ketchup and sauces
	Napkin	
	Cutlery	plastic knives, forks and spoons
Beverages	Can	soda (pop), juice or other beverage
	Plastic Bottle	pop, liquor, electrolyte drinks
	Glass Bottle	pop, liquor, juice (includes those found broken)
	Carton	typically milk products waxed carton
Confectionary	Chocolate	any candy bar wrapper
	Gum	any parts of the packaging for gum
	Chip Bag	
	Candy Wrap	all other forms of candy wrappings
Containers	Cigarette Pack	
	Tetra Pac	small drinking juice boxes
	Other Beverages	any other not covered under another catogory
	Plastic Bag	typically shopping bags
Uncategorized	Cardboard	
	Paper	this may include the bag from take out service

Uncategorized (continued)	Plastic	
	Glass	
	Styrofoam	
	Cloth	textiles
	Metal	
	C&D Debris	construction and demolition debris
	Car Parts	tir . s, mufflers
	Garbage Bags	complete, filled garbage bags

Figure 1. Overview of waste found Island wide by general product category.

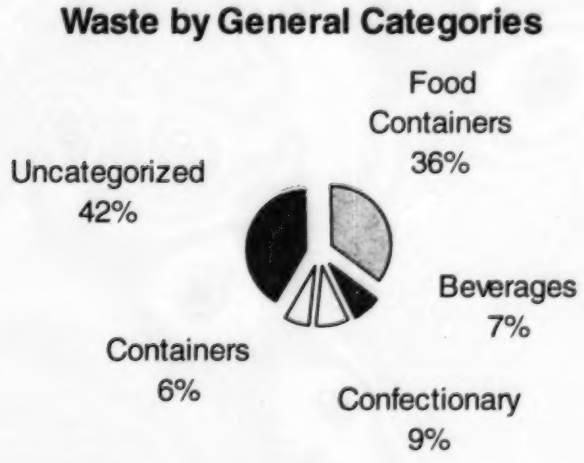


Figure 2. Overview of waste found Island wide by product type.

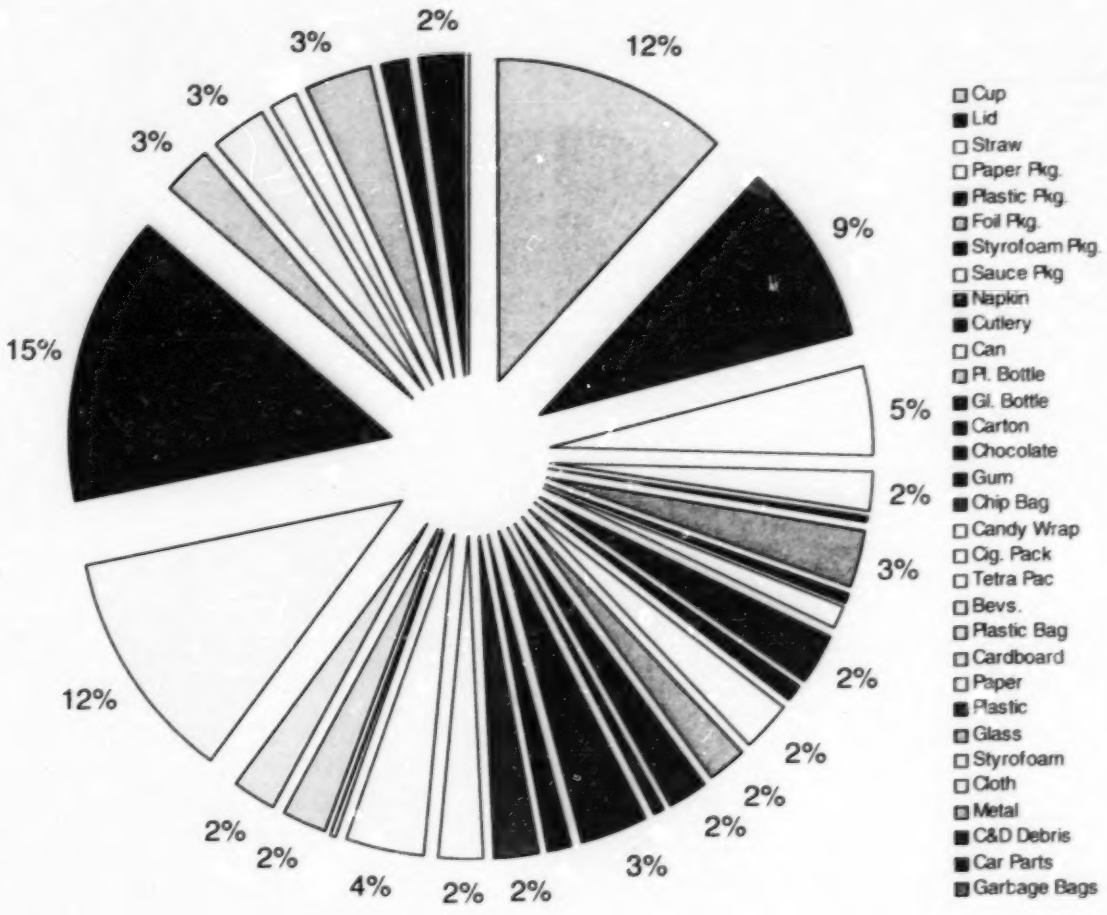


Figure 3. Significant product types of waste found Island wide.

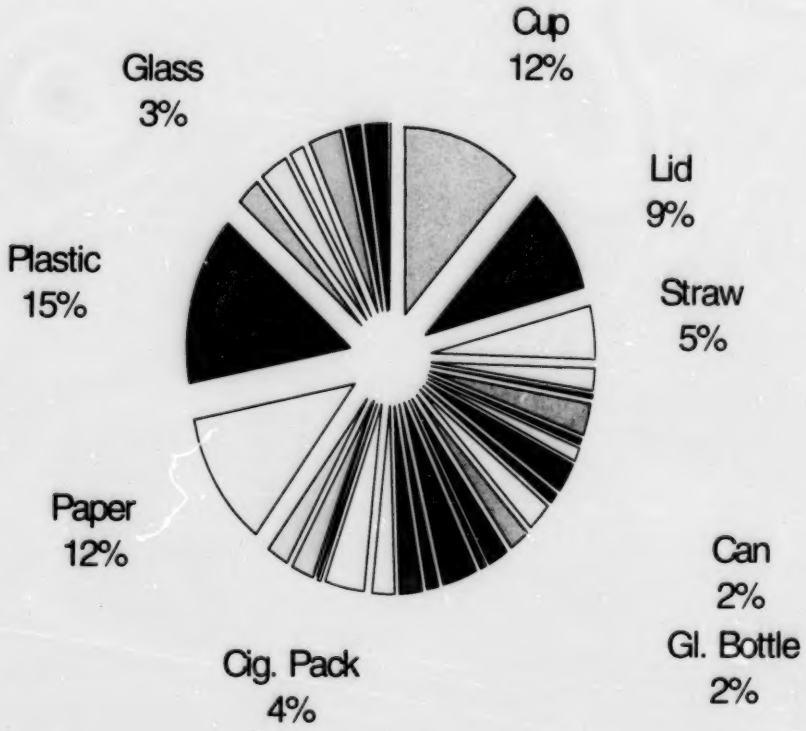
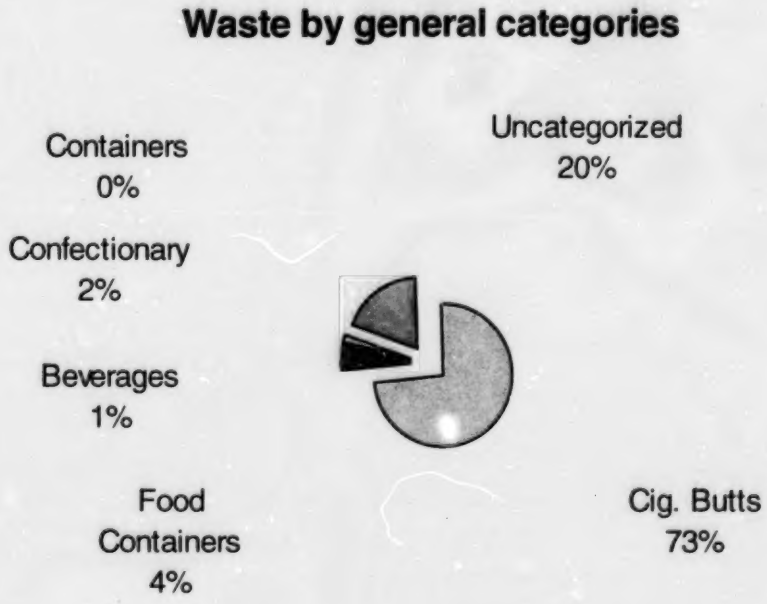


Figure 4. General waste categories for three selected sites including cigarette butts.



Three of the 45 sites were also examined for cigarette butts. The results were 383, 681, and 320 butts collected at each site. The graph above shows the results found at the three sites. This item was smaller than the products outlined for collection in the survey criteria, but it was felt that it was important to have a handle on this component of litter.

While the volume is not very significant, the numbers far exceed other products collected for each survey area. Some of the high numbers by product type for cigarette butts can also be attributed to the fact that these items may not be readily collected during regular roadside cleanups and therefore represent an accumulation of more than one year. While a time consuming item to find, collect and count, it is recommended that this item become a component of future litter surveys.

NOTE: Containers is not at 0% but rounded down due to a total number representing of less than 0.5% of the items found in the sampling area.

Waste Watch

The Waste Watch program is a source separation program for waste management that requires all households and businesses serviced by the program to put materials into one of three streams. These include recyclables, organic and waste. The program is mandatory with residents paying for the service on their property tax bill while business owners have the options of self service or contracting a third party to haul the material away for appropriate disposal.

The program is being expanded to all areas of the province, but only a portion is currently receiving all of the Waste Watch services. All homes have curbside recyclable collection. The organic and waste collection will follow this fall.

While the program is residential and commercial based, it was anticipated that it might result in an impact on roadside litter. Figure 3. and Figure 4. compare the composition of the litter found in full Waste Watch areas and outside full Waste Watch areas. The types of materials found at roadside varies little between each area. It is in the amount of each material type where a difference can be found.

The full Waste Watch program area had significantly less fast food foil wrap, glass bottles, chocolate candy wrappers, plastic bags, general plastic waste, and styrofoam. Paper products were found to be significantly higher. All other material categories in this survey were found to be statistically similar. In general, the Waste Watch program appears to have an effect, albeit a small one, on the prevalence of roadside litter in the local area. The paper products waste being higher appears to be an anomaly in the data that cannot be explained at the present time.

Figure 5. Waste sorted by category for areas not fully serviced by Waste Watch.

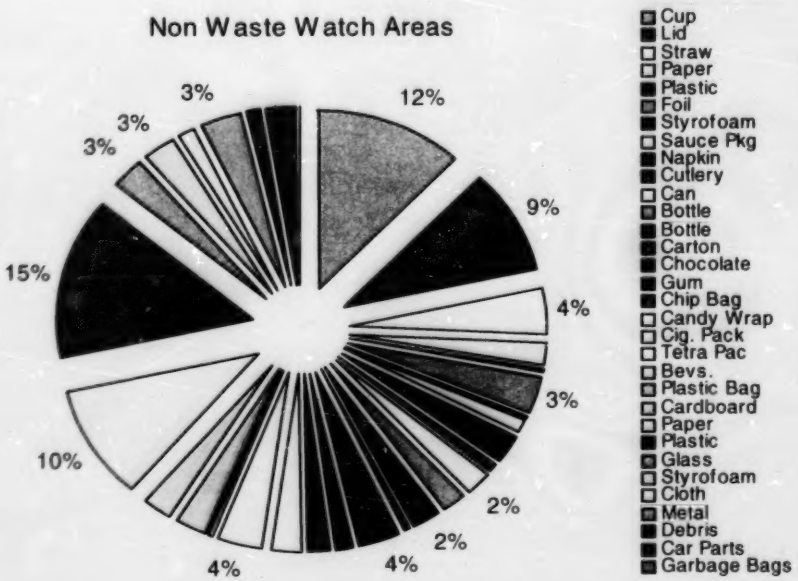
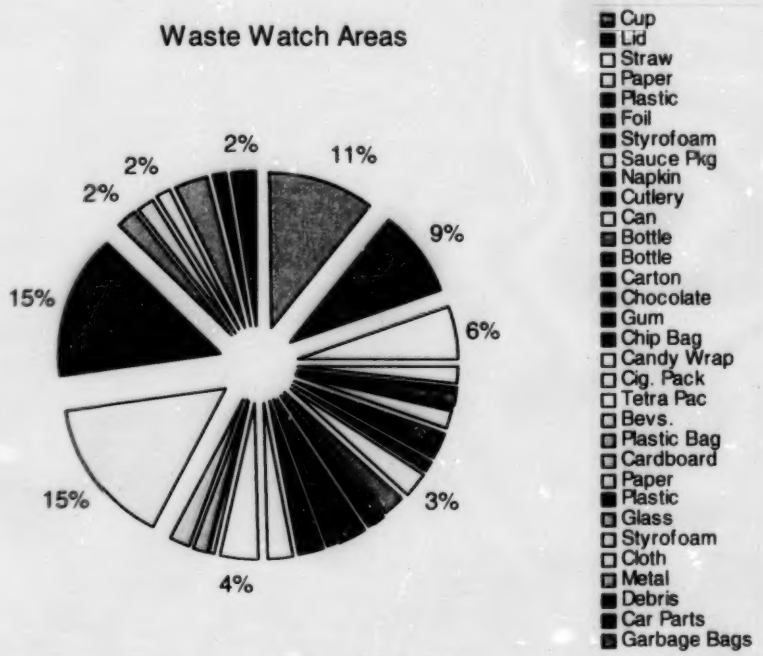


Figure 6. Waste sorted by category for areas serviced by the full Waste Watch program.



Urban and Rural

The initial plan for the study was to dissect regions by rural, urban and suburban areas. This proved difficult to measure for P.E.I. One cannot distinguish where the urban area ends and the suburban begins. As such, areas were categorized as rural or urban. No sites were collected directly in the downtown core of either Summerside or Charlottetown.

The results show a significant difference between the rural and urban areas both in terms of the quantity and variety of litter found. It appears that many urban areas were cleaner than their rural counterparts. Below is the comparison of the material found.

Figure 7. Average of food container items found per site in urban versus rural areas.

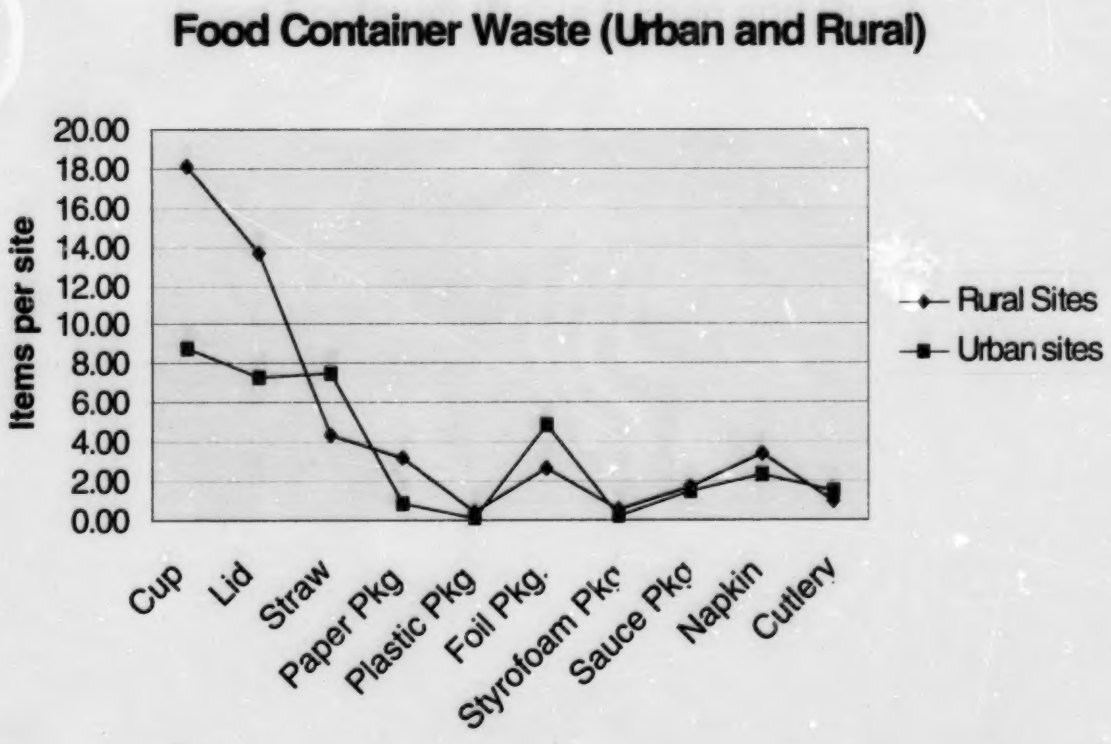


Figure 8. Average of beverage and confectionary items found per site in urban versus rural areas.

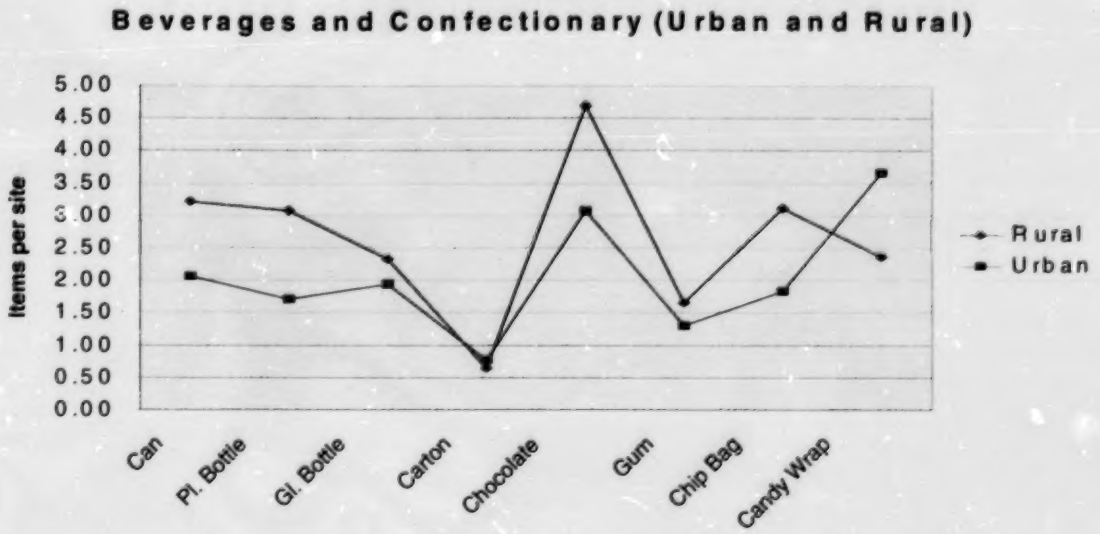
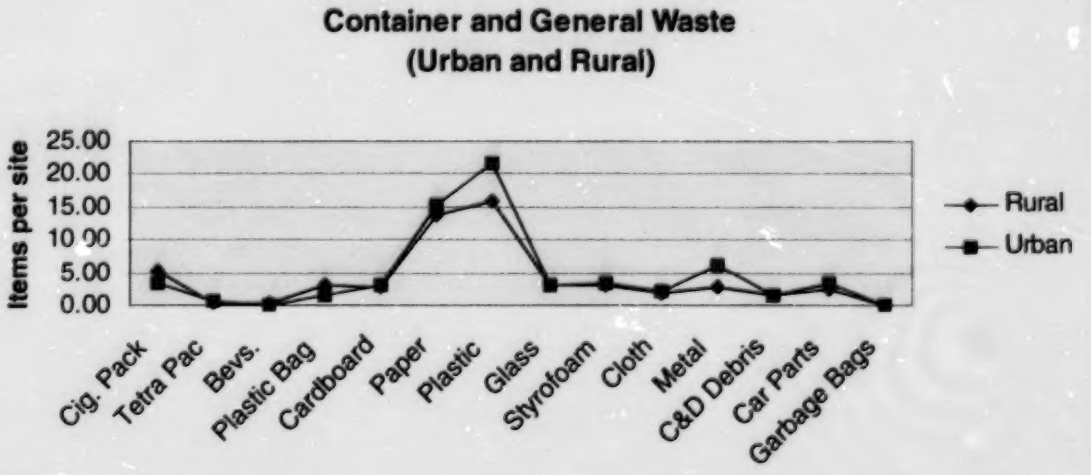


Figure 9. Average of container and general waste items found per site in urban versus rural



areas.

There are several factors that can account for the results of material found in rural and urban areas. Many of the rural sites were within a short driving distance of many community centres. On average they were about five kilometres from a settlement that could be classed as urban (for P.E.I. anyway). The composition of the material found suggests its origins are from the urban areas.

The above information shows that food containers, beverages and confectionary items tend to be found in more significant numbers in the rural areas than in the urban areas. In general, most products were found in twice the number than in the urban setting. When looking at the general categories of waste that could not be specifically classified under this survey, the results are virtually the same.

The common theory for these results is that people in a vehicle get a certain distance from the point of purchase, finish the food product and discard the refuse. The data suggests that this seems to hold true.

Other Jurisdictions

There are a few other jurisdictions in North America that have made the results of their surveys public. While the raw data is not known, the compilation of information can be compared to that found in Prince Edward Island. The results show that the litter in Prince Edward Island is similar in composition to that of other jurisdictions. Food packaging, especially those originating from food service establishments is the most predominant form of litter. The same was found to be true in not only Nova Scotia and New Brunswick surveys but also the previous Prince Edward Island survey completed in 1990.

Since the information for PEI was collected by volume, it is difficult to make a true comparison to other regions but it appears that the volume collected is less than that found in the neighbouring provinces. It is likely that this can be attributed to successful annual cleanups by various Island organizations and not necessarily to the higher consciousness of Island drivers.

Enforcement Action

Only once during the survey were enforcement people called to investigate a site. Several intact and complete garbage bags were found adjacent to a survey site. These do not show up in the survey itself but under the terms of the methodology required the staff to engage enforcement officials to take action.

Appendix 'A'
Survey Locations

No.	Site	County	Setting	Waste Watch
1	Wilmot	Kings	Rural	No
2	Orwell	Kings	Rural	No
3	Peters Road	Kings	Rural	Yes
4	Avondale	Queens	Rural	No
5	Morell	Kings	Urban	No
6	Sturgeon	Kings	Rural	Yes
7	Hazelbrook	Queens	Rural	No
8	Dunstaffnage	Queens	Rural	No
9	Rte 246	Queens	Rural	No
10	Primrose	Kings	Rural	No
11	Fortune	Kings	Rural	No
12	Five Houses	Kings	Rural	No
13	St Peters	Kings	Urban	No
14	Lwr Montague	Kings	Rural	No
15	Cardigan	Kings	Urban	No
16	Souris	Kings	Rural	No
17	Kilmuir	Kings	Rural	No
18	Pooles Corner	Kings	Urban	No
19	48 Road	Kings	Rural	No
20	Vernon	Kings	Urban	No
21	St. Roch	Prince	Rural	No
22	St Peters Rd	Queens	Urban	No
23	Rte 104 - Indian River	Prince	Rural	Yes
24	Rte 150	Prince	Rural	No
25	Rte 11 - Abram's Village	Prince	Urban	Yes
26	Bypass Rd	Queens	Urban	No
27	Rte 142	Prince	Rural	No
28	Rte 2 - Springfield	Queens	Rural	No
29	Rte 2 - Up fr. Bloomfield Corner	Prince	Urban	No
30	Rte 224 - St Anns	Queens	Rural	No
31	Brookfield	Queens	Rural	No
32	Brackley Pt Road	Queens	Urban	No
33	Desable	Queens	Rural	No
34	Inverness/Portage	Prince	Rural	Yes
35	Kensington	Prince	Urban	Yes
36	Kinkora	Prince	Urban	Yes
37	Rte 2 - Summerside	Prince	Urban	Yes
38	Central St - S'side	Prince	Urban	Yes
39	Miscouche	Prince	Urban	Yes
40	New London	Queens	Rural	No
41	St Hubert	Prince	Rural	Yes
42	Rte 12 - Poplar Grove	Prince	Urban	Yes
43	Cornwall	Queens	Urban	No
44	North Tryon	Prince	Rural	Yes
45	Summerville Rte 420	Kings	Rural	No

Appendix 'B'
Sample Survey Sheet

Site# _____ Samplers _____

Date/Time _____ Samplers _____

Beginning Point: .....

End Point: .....

Data Sheet

Cup	Lid	Straw	Food Container (paper/foil?)	Sauce pkg.	Napkin	Cutlery

Can	Plastic Bottle	Glass Bottle	Carton

Chocolate	Gum	Chip Bag	Candy Wrap

Cig. Pack	Tetra Pac	Bevs.	Plastic Bag

Cardboard		
Paper		
Plastic		
Glass		
Styrofoam		
Cloth		
Metal		
Construction Debris		
Car Parts		
Full garbage bags		

NOTES: . . . . . .

. . . . . .

. . . . . .

Appendix 'C'
Average Units Per Site
(100 metres both sides)

PRODUCT	Avg.	PRODUCT	Avg.
Cups	14.58	Chip Bag	2.62
Lids	11.29	Candy Wrap	2.84
Straws	5.51	Cigarette Pack	4.58
Paper Food Pkg	2.31	Tetra Pac	0.33
Plastic Food Pkg	0.33	Other Beverages	0.13
Foil Food Pkg	3.47	Plastic Bag	2.60
Styrofoam Food Pkg	0.40	Cardboard	2.84
Sauce Pkg	1.58	Paper	14.18
Napkin	3.02	Plastic	18.16
Cutlery	1.13	Glass	3.11
Can	2.78	Styrofoam	3.16
Plastic Bottle	2.56	Cloth	1.82
Glass Bottle	2.18	Metal	4.02
Carton	0.69	C&D Debris	1.58
Chocolate	4.07	Car Parts	2.82
Gum	1.51	Garbage Bags	0.04

Cigarette Butts (3 sites only)	461.33